

REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Interview

The Examiner is thanked for the courtesy extended during a personal interview conducted on October 18, 2005. Each of the amendments presented above was discussed during the interview, together with the prior art and double patenting rejections, as set forth below.

2. Rejections of Claims 1-25 Under 35 USC §112, 1st and 2nd Paragraphs

This rejection has been addressed by amending the language of claims 5 and 17 (now included in respective claims 1 and 14) to:

- a. recite illumination of the oversampled complex image by the optical wave;
- b. specify that the addition of the complex field to the diffracted image produces an interference field; and
- c. recite extracting rather than encoding of the amplitude values of the sum of the complex field.

Support for the amendments to original claims 5 and 17, as included in claims 1 and 14, is found in lines 28-31 on page 12 of the original specification.

In addition to the amendments to original claims 5 and 17, claims 8 and 20 have been amended to recite that the inverse of the complex transform is applied to the product of the respective complex transforms of the two functions, and claim 23 has been amended to delete objected-to “preferably” phraseology (by adding new claim 26).

It is respectfully noted that the above amendments were indicated by the Examiner during the October 18 interview as overcoming the rejections of each of claims 1-25. Even though claims 1-4, 6, 7, 9-17, and 19-26 rejected only generally as being of “narrative form” and were

not amended, the Examiner indicated during the interview that elimination of the confusing terminology of claims 5-17 also resolved any ambiguities in the meaning of the remaining claims.

3. Rejection of Claims 1-4 and 14-16 Under 35 USC §102(b) in view of U.S. Patent No. 4,969,700 (Haines)

This rejection has been rendered moot by the incorporation, into claims 1 and 14, of the limitations of claims 5 and 17.

In addition, it is again respectfully noted that the Haines patent does not disclose or suggest a method or system of producing a hologram of a virtual object, as recited in original claims 1-4 and 14-16, which involves the step of computing a set of two-dimensional images representing “the object” (*i.e.*, the entire object) as seen from respective different viewpoints in three-dimensional geometrical space, and computing elementary holograms based thereon. The alleged “two-dimensional” images of Haines result from the use of “windows” 200 or 400 that restrict the field of view of the object to parts of the object, rather than the entire object.

This evidenced by col. 5, lines 34-37 of the Haines patent, which explains that Haines’ method systematically selects “*only rays from a limited number of points in the object for use.*” In addition, col. 6, line 36 of Haines continues that “*the amplitude of the selected rays [...] are determined by the computer across a surface [...]. The rays from the object that are selected [...] are those that are on a straight line between the hologram grid element and its associated window.*” Finally, Haines specifically states that the windows in question (windows 200 and 400), limit the field of view of each hologram element 52,54 such that each hologram element sees a restricted field of view of the object through the window (as explained in col. 6, lines 45-51 and lines 59-61).

It is noted that the Examiner agreed during the interview that Haines in fact does not disclose representing the full view of the entire object at each element hologram, as claimed. However, the Examiner indicated that such representation was, in her experience, taught by other references, such as U.S. Patent 6,038,042. She therefore suggested combining the subject matter

of claims 1 and 5, and 14 and 17. While the Applicant does not agree or admit that the subject matter of original claims 1-5 is in any way suggested or anticipated by any reference, the Applicant has nevertheless amended claims 1 and 14 to include the subject matter of respective claims 5 and 17.

4. Rejection of Claims 5-13 and 17-25 Under 35 USC §103(a) in view of U.S. Patent Nos. 4,969,700 (Haines) and 5,668,648 (Saito), and the SPIE article by Michelin *et al.*

This rejection is again respectfully traversed on the grounds that the Saito patent and the Michelin article, like the Haines patent, fails to disclose or suggest any steps or means corresponding to the claimed computation of (i) two-dimensional images representing the object as seen from different viewpoints in three-dimensional space and (ii) elementary holograms each corresponding to one of the two-dimensional images, the final hologram being formed by a combination of the elementary holograms computed from the two-dimensional images representing the object as seen from different viewpoints in three-dimensional space.

Instead, the Saito patent is directed generally to use of Fourier transforms to generate diffraction elements similar to those that make up the hologram of Haines, while the Michelin article teaches generally how to use Fourier transformations to compute amplitude transmittance from complex fields representing the reference wave. Neither reference is directed to construction of a hologram from two-dimensional images, much less two-dimensional images that represent the entire object in the manner claimed.

Furthermore, even if the Examiner is correct that the claimed computation of two-dimensional images each representing the object as seen from different viewpoint in three-dimensional space is known from references not yet made of record, it is respectfully submitted that the **combination** of such representation with the steps recited in claims 5 and 7 is not known and not suggested by any reasonable combination of the Haines and Saito patents, and/or the Michelin article. The Examiner appeared to acknowledge the non-obviousness of the

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combination (subject, of course, to an update search) when she suggested, during the interview, combining claims 1 and 5 (and 14 and 17).

5. Double Patenting Rejection

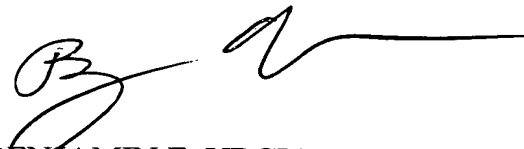
This rejection is again respectfully traversed on the grounds that the Haines patent does not disclose or suggest the claimed set of two-dimensional image data representing the entire object as seen from different viewpoints in three-dimensional geometric space, or a system or method in which the different viewpoint holograms are used to compute a set of elementary holograms from which the final hologram is constructed. Furthermore, the Applicant believes that the proposed *combination* of the calculation process claimed in Applicant's U.S. Patent No. 6,344,090 with the step of computing a set of different viewpoint holograms of the entire image would not have been obvious even if the step were known.

Withdrawal of the obviousness double patenting rejection is therefore respectfully requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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